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the fullest recognition of the extremely complex magmatic solutions from which they have come and of the varied conditions determining the characters of the rocks themselves, and not infrequently producing rocks of different mineral composition from a single magma.

This volume is a treatise on igneous rocks which is manifestly an unfettered expression of the author's understanding of them rather than a text-book. Yet it outlines so logically the view of these objects which the student should be made to understand that it may be used as the basis of instruction in all advanced courses.

The book appears in uniform style with "Rock Minerals" by the same author. The second volume, descriptive of known rocks, is in preparation, and will be awaited with interest and with the hope that the author may be successful in making his subject more attractive than is the case with existing literature of the kind.

WHITMAN CROSS

Railroad Structures and Estimates. By J. W. ORRUCK, C.E. New York, John Wiley & Sons. 270 pages, 94 illustrations. \$3 net.

Probably the primary purpose of this book is to furnish data for estimating the various parts of a railroad, and it contains a compilation of cost data which should prove of value to many a young engineer, not only in furnishing reasonable figures of costs, but also in stimulating him to secure similar figures for his own locality or from his own railroad. Costs vary from time to time and also locally, so that figures for estimates can not safely be swallowed whole either from this book or any other. A book of this sort then should find its best value in suggesting methods of cost estimation, and in analyzing the constituent parts of costs. This book is somewhat uneven from this standpoint, some chapters having the elements of cost well classified, while others are very general, as in the costs of tunnels where a short table of costs per lineal foot is quoted from Drinker's rather ancient treatise; while the estimates for turnouts are itemized, the cost of a split switch is given as \$30 to \$50; and similarly for laying and sur-

facing it, \$30 to \$50; a variation of considerable amount without special explanation to account for it. The criticism applies perhaps to the difficulty of the subject rather than to inferiority of treatment.

The compilation of cost data involves a knowledge of the structures or materials to be built or used; as a result a large share of the book is given to such descriptions, or sometimes practically specifications. There are given, also, a number of tables which seem hardly consistent with the general purpose of the book; among these are one "for putting in frogs and switches," others for "feet head and equivalent pressure in pounds per square inch," "friction of water in pipes," "friction of water in elbows"; also a table of "horse-power."

The chapter on buildings, covering eighty-eight pages, is quite largely given to descriptions, and these cover many classes of buildings; it has not quite the merit of a treatise and yet any one is likely to find there some thing he wants and which is worth while. In the estimates of this chapter, some are well analyzed and itemized, while some others are very general and with wide range of cost values, a freight shed with modern floors being estimated at 25 to 50 cents per square foot.

The chapter on Specifications and Contracts, covering thirty-one pages, is inadequate, and except for four pages on estimates, hardly in line with the apparent purpose of the book.

The book in its mechanical make-up has the general appearance and quality of the Wiley books on engineering, which means that it is satisfactory. The scope is indicated by the following Chapter Index:

I. Track Materials. II. Fences, gates, sign posts. III. Culverts. IV. Bridges. V. Buildings. VI. Water Stations. VII. Tanks. VIII. Specifications and Contracts. IX. Estimating Notes.

C. F. ALLEN

Neuere Ergebnisse auf dem Gebiete der Speziellen Eiweisschemie. PROF. EMIL ABDERHALDEN. Jena, Verlag v. Gustav Fischer.
"Die Neueren Ergebnisse auf dem Gebiete

der Speziellen Eiweisschemie" first appeared as a chapter in the "Handbuch der Biochemie" edited by Karl Oppenheim. The entire subject of proteins was treated in that "Handbuch" by several authors, and it was the part of Professor Abderhalden to present that phase of the progress in protein-chemistry which was made possible through the new analytical and synthetical methods, introduced by Emil Fischer.

Professor Abderhalden was a close associate of Emil Fischer during the time when the work was in progress and that makes the chapter more vivid and authoritative than any other on the subject of protein chemistry, written for the Oppenheimer Handbuch.

The work on protein chemistry of Fischer and his school falls into two large groups: one which brought to light the elementary components of the protein molecule, and the second, which elucidated the character of their linkage in the protein molecule. The first was in its nature principally analytical, the second synthetical. The work in either direction was preceded by a careful study of the properties of some derivatives of aminoacids. In course of this study Fischer introduced an improvement into the method of Curtius for preparing the ethylesters of the aminoacids from their hydrochlorides. This made possible the distillation of the esters and their separation one from another in a convenient, neat and comparatively rapid manner. The part assigned by Fischer to Abderhalden and his co-workers was to apply this process to the separation of the aminoacids obtained on the cleavage of nearly every protein known in nature. A part of the book contains a complete and concise account of all this work.

The property of the esters of the aminoacids to form anhydrides of the acids was the basis for the synthetic formation of peptides. It is safe to say that this discovery was the most important phase in the development of protein chemistry, since it contained the key to our knowledge of the manner in which individual aminoacids are linked in the protein molecule.

The original method of peptid synthesis was

later improved through the introduction of the halogenacyl synthesis which led to the formation of optically active peptides. This new achievement in its turn opened the way to the study of the configuration of peptides and of the relation of configuration to the action of proteolytic enzymes. The book of Abderhalden gives a complete account of all these achievements in a very concise form. The properties of all known aminoacids and their derivatives are described in a manner which makes the work serve as a valuable reference book. The analytical methods are also described, though not always in minute detail. All this makes the book very serviceable to the investigator, and at the same time it gives a good survey of the development of our knowledge of the chemical structure of the protein molecule. The physical properties of the proteins and the character of their primary cleavage products are not discussed by Abderhalden.

P. A. LEVENE

THE ROCKEFELLER INSTITUTE
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SCIENTIFIC JOURNALS AND ARTICLES

THE opening (October) number of volume 16 of the *Bulletin of the American Mathematical Society* contains the following papers: "Note on Fermat's Numbers," by J. C. Morehead and A. E. Western; "An Extension of Certain Integrability Conditions," by J. E. Wright; "Necessary Conditions that Three or More Partial Differential Equations of the Second Order shall have Common Solutions," by C. A. Noble; "Note on Determinants Whose Terms are Certain Integrals," by R. G. D. Richardson and W. A. Hurwitz; "On the Tactical Problem of Steiner," by W. H. Bussey; "On the So-called Gyrostatic Effect," by A. S. Chessin; "A Continuous Group related to Von Seidel's Optical Theory," by A. C. Lunn; "Shorter Notices": Runge's *Analytische Geometrie der Ebene*, by M. Bôcher; Netto's *Gruppen- und Substitutionentheorie*, by W. B. Fite; Czuber's *Einführung in die höhere Mathematik*, by C. L. E. Moore; Ball-FitzPatrick's *Recréations mathématiques*, by D. E. Smith; Pockel's